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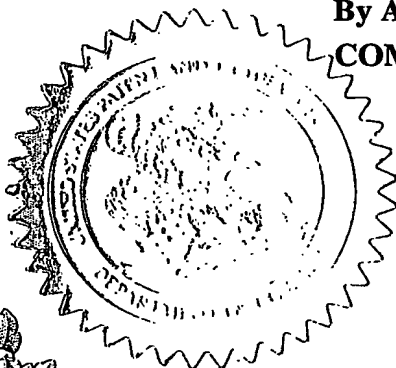
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<input checked="" type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto					
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ENCLOSED APPLICATION PARTS (check all that apply)					
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Respectfully submitted,

SIGNATURE

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Date 04/25/2003

REGISTRATION NO
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Docket Number:

35,289

PUS-P001-037

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3579 U.S. PTO
60/465758

04/25/03
1c784 U.S. PTO

RATCHET FOR ORTHOPEDIC SURGERY

Background of the Invention

This invention relates to drivers for rotary surgical cutting tools, and, more particularly, to reamer drivers used in orthopedic surgery.

Surgical ratchets are complicated mechanical devices which have crevices and recesses that are difficult, if not almost impossible to clean with ease. Devices that are not properly cleaned and sterilized run the risk of disease transfer from patient to patient following the emergence of certain "prions" that are not killed by normal hospital sterilisation and need to be physically removed by washing / rinsing. For this reason, in the prior art, ratchet mechanisms have been hermetically sealed to prevent contamination. However, the seals are not 100% reliable.

What is needed therefore is a surgical ratchet that is easily disassemblable for cleaning, so as to ensure sterilization.

Summary of the Invention

A surgical ratchet assembly includes a handle, a driver, a ratcheting mechanism and a locking mechanism. The driver is received within the handle in a rotatable relationship with respect thereto. The ratcheting mechanism is interposed between the handle and the driver. The ratcheting mechanism includes pawls which can be selectively locked out of engagement with a toothed hub via a selector. A locking mechanism releasably holds the handle to the ratchet mechanism. Unlocking of the locking mechanism enables ready disassembly of the assembly for cleaning and component sterilization.

In another feature, the selector includes a position in which both pawls are in an engaged position, thus locking the ratchet mechanism against free movement in either direction.

In another feature, the selector includes a position in which both pawls are in a released, nonengaged position, disengaging the ratchet mechanism, thus permitting free motion in either direction.

An object of the invention is to provide a surgical ratchet that is readily disassembled for cleaning and sterilization.

Another object of the invention is to provide a reliable ratchet that is easy to operate.

Brief Description of the Drawings

Fig. 1 is a perspective view of the ratchet of the invention.

Fig. 2 is cross sectional view of the ratchet of the invention.

Fig. 3 is a partially disassembled view of the ratchet of the invention.

Figs. 4a to 4c are a series of views showing the disassembly of the ratchet for cleaning.

Figs. 5a and 5b are a series of views showing the assembly of the ratchet after cleaning.

Detailed Description of the Preferred Embodiment

In the preferred embodiment, as shown in Figs. 1 to 4e, a surgical ratchet assembly 0 includes a handle A (1, 9), a driver B (3, 8, 17, 18), a ratcheting mechanism C (4-7, 14, 16) and a locking mechanism D (9-11). The driver B is received within the handle A in a rotatable relationship with respect thereto. The ratcheting mechanism C is interposed between the handle A and the driver B. The locking mechanism D releasably holds the handle A to the ratchet mechanism C. Unlocking of the locking mechanism D enables ready disassembly of the assembly 0 for cleaning and component sterilization.

The locking mechanism D includes a ring 11 which is mounted over an annular surface

on the rearmost end of the handle A. The ring 11 is locked by a retainer ring (not shown) so as to be rotatably retained on the handle A. The inner surface of the ring 11 includes cam surfaces (not shown) which selectively bias a ball 10 into or out of a recess in the handle to engage or disengage a recess in a component, namely, an annular rearward end of a toothed hub, of the ratchet mechanism.

The ratcheting mechanism C is made up of an internal housing 4, left and right hand pawls 5, a selector E (7, 14, 16), and the toothed hub 2. The selector E rotates about the axis of the driver B, about an end of the housing, and selectively locks, via a spring detent 7, 14, in one of two recesses in the internal housing 4, at two extreme positions. The selector E has an internal surface having cam portions (adjacent the left ends of the pawls 5) which selectively engage an end of either the left or right hand pawls 5. The toothed hub 2 is an elongated, hollow shaft, having, at one end thereof (left end), a circumferentially toothed cylindrical outer surface, and, at the other end thereof, the annular rearward end in which the recess (where ball 10 enters) into which the ball 10 of the locking mechanism D engages. In toothed hub is keyed against rotation relative to the handle A and therefore moves with the handle. In other words, when the handle A is rotated, the toothed hub 2 rotates. The pawls 5 are formed so as to engage with the symmetrical, circumferential teeth of the toothed hub 2, thus preventing motion in one direction, while permitting rotation in the opposite rotation. In the present embodiment, the pawls 5 have fingers presenting a flat, locking surface which engages a tooth of the toothed hub 2, if urged in one direction, and an opposing angled surface, which does not lockingly engage a tooth of the toothed hub 2, just enabling relative rotation of the pawl and toothed hub, when urged in the opposite direction.

Because the pawls 5 are pivotally mounted in the housing 4 and normally urged into an engaging relationship by a spring 7, the cam surfaces of the selector 6 selectively moves one or the other out of engagement with the toothed hub 2, thus enabling a user to drive the driver in one direction, while permitting relative movement of the toothed hub and the pawls when turned in the other direction. Thus, movement of the selector 6 in one or the other extreme positions

allows the user to select a ratcheting direction.

In a mid position, in which there may optionally be a spring detent, the cam surfaces of the selector 6 do not engage either end of the pawls 5 and thus lock the ratchet mechanism C of the invention in both directions, enabling a functioning just as a normal, non-ratcheting driver.

In another mid position, the cam of the selector 6 optionally moves both pawls 5 out of engagement with the toothed hub 2, thus providing a neutral position in which the handle is free to turn in either direction.

The driver A includes a fitting interface 18 fixed to the hollow shaft 3. The hollow shaft 3 extends from the front to the rearward end of the ratchet 0. The fitting interface 18 interfaces with an AO fitting, a Snyder fitting, or another known fitting. A fitting locking mechanism F (8, 17) locks the fitting (not shown) into engagement with the driver A. The fitting locking mechanism F includes a spring 8 and a locking sleeve 17.

Referring now to Figs. 4a to 4c, the disassembly of the ratchet 0 for cleaning is shown. In a first disassembly step, the locking ring 11 is twisted to an unlocked position. In a second disassembly step, the ratchet body G (the driver B and ratchet mechanism C) is removed for cleaning.

Referring now to Figs. 5a and 5b, the reassembly of the ratchet 0 after cleaning is shown. In a first reassembly step, the ratchet body G is inserted into the handle A. The pin location and slot are noted in order that the user properly aligns the ratchet body with the handle A. The body G is pushed into the handle A until it can go no further. The locking ring 11 is then twisted into a locking position.

In an advantage of the invention, a surgical ratchet is provided that is readily disassembled for cleaning and sterilization.

In another advantage of the invention, a reliable ratchet is provided that is easy to operate.

Multiple variations and modifications are possible in the embodiments of the invention described here. Although certain illustrative embodiments of the invention have been shown and described here, a wide range of modifications, changes, and substitutions is contemplated in the foregoing disclosure. In some instances, some features of the present invention may be employed without a corresponding use of the other features. Accordingly, it is appropriate that the foregoing description be construed broadly and understood as being given by way of illustration and example only, the spirit and scope of the invention being limited only by the appended claims.

What is Claimed is:

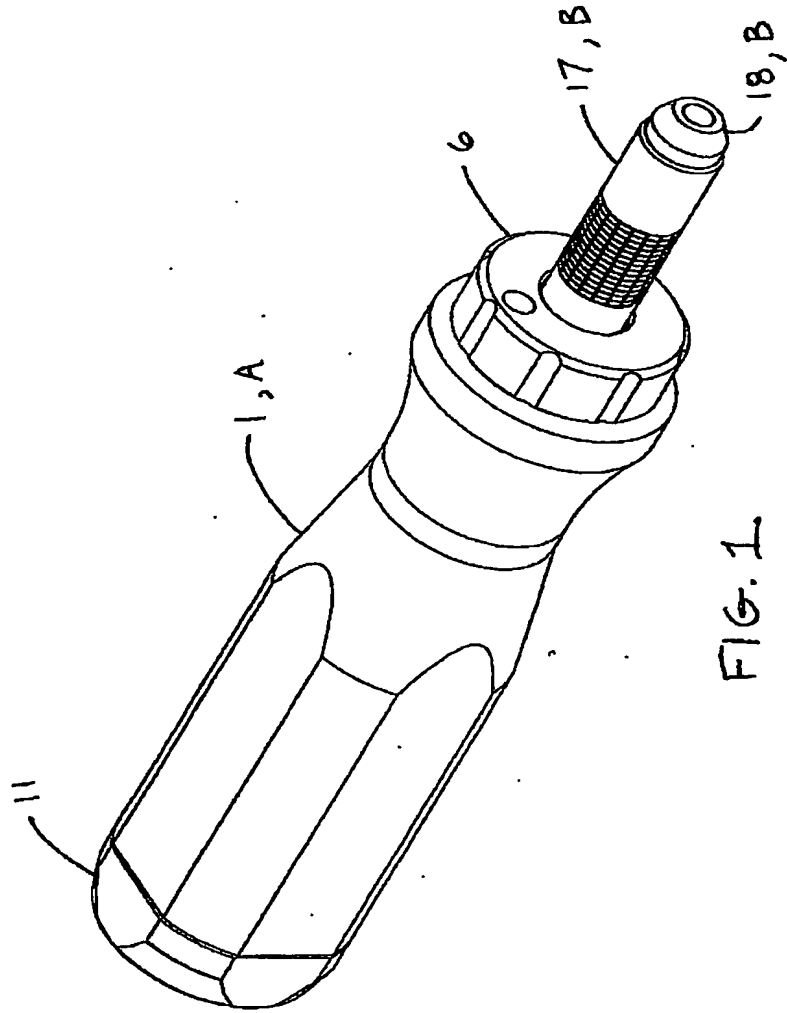
- 1 A surgical ratchet assembly made up of components including a handle, a driver received within the handle in a rotatable relationship with respect thereto, a ratcheting mechanism interposed between the handle and driver, and a locking mechanism releasably holding the handle to the ratchet mechanism, wherein unlocking of the locking mechanism enables ready disassembly of the assembly for cleaning and component sterilization.
- 2 The assembly of claim 1, wherein the locking mechanism comprises a ring rotatable on the handle, the ring having a cam surface selectively biasing a ball into or out of a recess to engage or disengage the ratchet mechanism to lock or unlock the assembly.
- 3 The assembly of claim 1, wherein the ratcheting mechanism comprises a housing in which left and right hand pawls are selectively pivotably engageable by a cam connected to a selection device for selection of a ratcheting direction and a toothed hub connected to the handle.

RATCHET FOR ORTHOPEDIC SURGERY

Abstract of the Disclosure

A surgical ratchet assembly includes a handle, a driver, a ratcheting mechanism and a locking mechanism. The driver is received within the handle in a rotatable relationship with respect thereto. The ratcheting mechanism is interposed between the handle and the driver. A locking mechanism releasably holds the handle to the ratchet mechanism. Unlocking of the locking mechanism enables ready disassembly of the assembly for cleaning and component sterilization.

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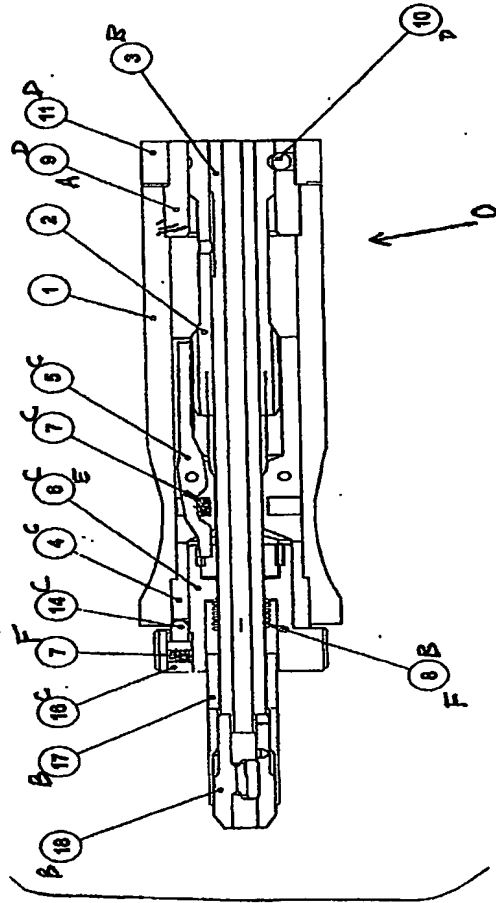
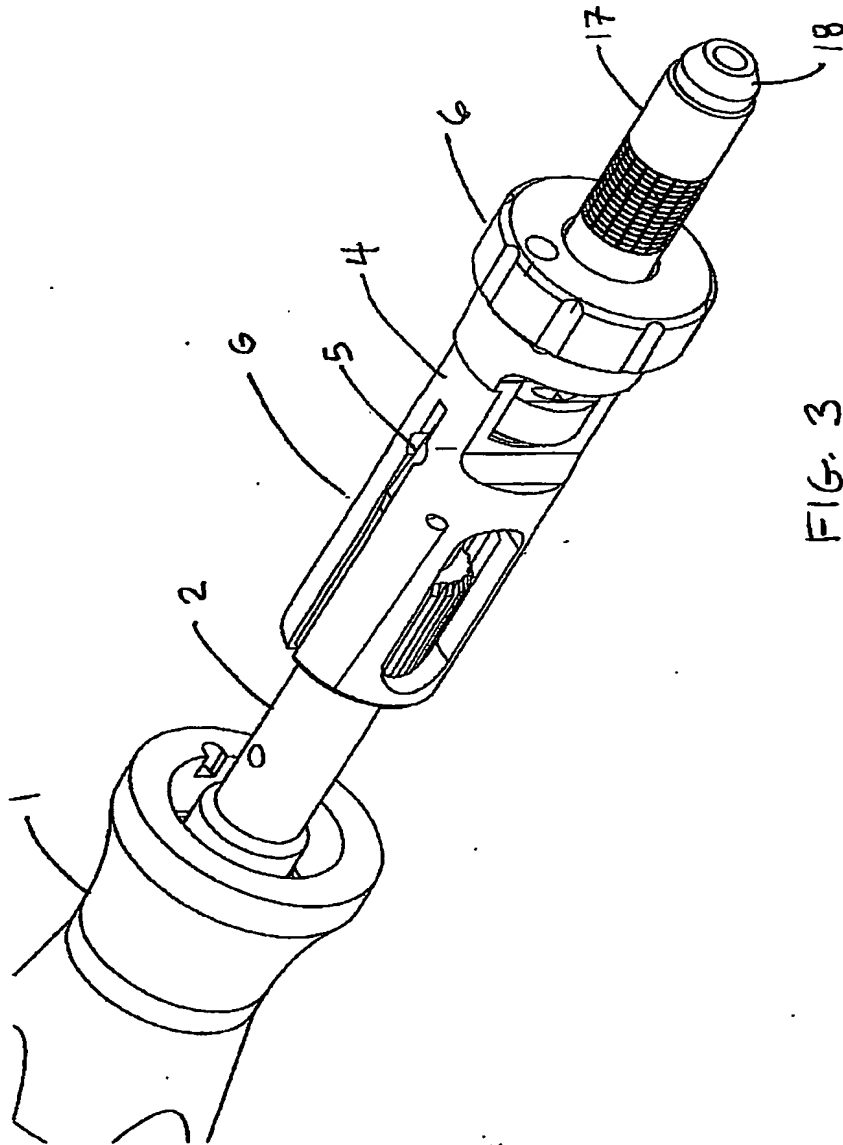


FIG. 2



Ratchet

Disassembling and cleaning

Twist to unlock

4b

Extract the ratchet body

4c

Assembly

Put the ratchet body into the handle

5a

Push the axis until blocked

5b

Twist to lock

Note pin location and slot

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